

5. The plasma reactor of claim 1 wherein each of said plural reentrant conduits comprises a conductive main portion and an insulating ring-shaped break.

6. The plasma reactor of claim 1 wherein:

said ceiling comprises:

- an internal gas manifold; and
- gas injection orifices coupled to said gas manifold;

said plasma reactor further comprises:

- a process gas supply; and
- a gas supply conduit coupled to said internal manifold and extending axially from said internal manifold and through an interior volume of said inner return cylinder to said process gas supply.

7. The plasma reactor of claim 1 further comprising a cap covering and contacting top edges of said inner, outer and intermediate return cylinders.

8. The plasma reactor of claim 7 wherein said inner and outer RF-driven cylinders are terminated at respective heights below said cap defining respective gaps between said inner and outer RF-driven cylinders and said cap.

9. The plasma reactor of claim 8 wherein said intermediate return cylinder is terminated at a height above said ceiling defining a separation between said intermediate return cylinder and said ceiling.

10. The plasma reactor of claim 1 further comprising:

- a first plurality of legs connected between said first RF power generator and respective first points on said inner RF-driven cylinder; and

- a second plurality of legs connected between said second RF power generator and respective second points on said outer RF-driven cylinder.

11. The plasma reactor of claim 10 wherein said respective first points are located on a top edge of said inner RF-driven cylinder and said respective second points are located on a top edge of said outer RF-driven cylinder.

12. The plasma reactor of claim 11 further comprising a first shield enveloping a portion of each of said first plurality of legs and a second shield enveloping a portion of each of said second plurality of legs.

13. The plasma reactor of claim 1 wherein said ceiling contacts respective bottom edges of said inner and outer return cylinders and respective bottom edges of said inner and outer RF-driven cylinders.

14. The plasma reactor of claim 1 wherein said inner and outer concentric zones of said ceiling are divided at a circular border corresponding to said intermediate return cylinder.

15. A plasma source for generating a plasma in a chamber, comprising:

a conductive plate covering said chamber;

a resonator having an axis of symmetry and comprising (a) inner and outer return cylinders and an intermediate return cylinder between said inner and outer return cylinders, (b) inner and outer RF-driven cylinders adjacent inner and outer surfaces, respectively, of said intermediate return cylinder, (c) said inner and outer return cylinders and said inner and outer RF-driven cylinders comprising bottom edges contacting said conductive plate; and

plural reentrant conduits on said conductive plate, wherein each of said plural reentrant conduits encloses a path extending in a radial direction.

16. The plasma source of claim 15 wherein said plural reentrant conduits comprise inner and outer pluralities of reentrant conduits disposed, respectively, in inner and outer concentric zones of said conductive plate.

17. The plasma source of claim 16 wherein each of said plural reentrant conduits extends in a radial direction.

18. The plasma source of claim 15 further comprising first and second RF power generators coupled to said inner and outer RF-driven cylinders, respectively, and a controller connected to said first and second RF power generators.

19. The plasma source of claim 15 wherein each of said plural reentrant conduits comprises a conductive main portion and an insulating ring-shaped break.

20. A plasma source for producing plasma in a chamber, comprising:

a plate overlying said chamber;

plural radially extending reentrant conduits on said plate;

a resonator comprising a shorted end and an open end and plural cylinders extending axially between said shorted and open ends, said shorted end facing and contacting said plate, said resonator further comprising inner and outer zones comprising, respectively, said plural cylinders comprising inner and outer RF-driven cylinders and a ground cylinder between said inner and outer RF-driven cylinders; and

first and second RF power generators coupled to said inner and outer RF-driven cylinders.

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